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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/467,100	12/10/99	COLEMAN R	PF-0049-2-DI

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EXAMINER	
HUTSON,R	
ART UNIT	**PAPER NUMBER**
1652	7

DATE MAILED: 09/01/00

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.	Applicant(s)
09/467,100	Coleman et al.
Examiner	**Group Art Unit**
Richard Hutson	1652

☒ Responsive to communication(s) filed on *Dec 10, 1999*

☐ This action is **FINAL.**

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire *3* month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claim

☒ Claim(s) *4-7 and 14-28* is/are pending in the applicat

Of the above, claim(s) *5, 14-18, 21, and 26* is/are withdrawn from consideration

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) *4, 6, 7, 19, 20, 22-25, 27, and 28* is/are rejected.

☐ Claim(s) _____ is/are objected to.

☒ Claims *4-7 and 14-28* are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☒ None of the CERTIFIED copies of the priority documents have been

☐ received.

☐ received in Application No. (Series Code/Serial Number) _____ .

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☒ Notice of References Cited, PTO-892

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). *2*

☒ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

DETAILED ACTION

Election/Restriction

1. Claims 4-7, 14-28 are still at issue and are present for examination.

Applicant's election with traverse of Group I, Claims 4, 6, 7, 19-25, 27 and 28 in Paper No. 6 is acknowledged. The traversal is on the ground(s) that the invention encompassed by the claims of group I could be examined at the same time as the invention encompassed by the claim of group VII. This is not found persuasive because while the searches for the groups overlap, they are not coextensive. The search for Group VII would require the search of subclasses unnecessary for the search of elected Group I. For example, search of Group I would require search of subclass 435/194 and search of Group VII would require search of subclass 435/6.

Further, it is noted that claim 21 was mistakenly combined with the claims of Group I drawn to a nucleic acid encoding human Jak2 kinase. Claim 21 should be restricted from the other claims of the application as being drawn to an independent invention, Group VIII drawn to a transgenic organism comprising a polynucleotide of encoding an amino acid sequence or fragment of SEQ ID NO: 2 or a naturally occurring amino acid sequence having at least 90% identity to SEQ ID NO: 2, is classified in class 800, subclass 13.

2. Inventions VIII and I are unrelated. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different modes of operation, different functions, or different effects (MPEP § 806.04, MPEP § 808.01). In the instant case the different

inventions have different uses. The DNA has utility such as encoding a protein or a hybridization probe, while the transgenic animal has a utility as an animal model.

Inventions VIII and III and V are unrelated. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different modes of operation, different functions, or different effects (MPEP § 806.04, MPEP § 808.01). In the instant case the different inventions have different uses. As discussed above, the transgenic animal has utility as an animal model while the proteins of groups III has utility as an antigen for antibody synthesis and the antibody of group V has utility for the method of detecting human Jak2 protein levels.

The transgenic animal of group VIII is unrelated to the methods of Groups II, IV, VI or VII as they are neither used nor made by the methods of Groups II, IV, VI or VII.

3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

4. During a telephone conversation with Susan Sather on 8/15/2000 a provisional election was made with traverse to prosecute the invention of group I, claims 2-4, 6, 7, 19-20 and 22. Affirmation of this election must be made by applicant in replying to this Office action.

5. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any

amendment of inventorship must be accompanied by a petition under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claims 5, 14-18, 21 and 26 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention, the requirement having been traversed in Paper No. 6.

Claim Objections

6. Claims 4, 6 and 7 are objected to because of the following informalities: Claims 4, 6 and 7 depend from canceled claims 2 and 3. Appropriate correction is required.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claim 19 (20 and 22 dependent from) is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

9. Recitation of the phrase "biologically active" renders the instant claims vague and indefinite. A biologically active fragment of an amino acid sequence of SEQ ID NO: 2 may encompass a variety of different biological activities. These include but are not limited to

immunological activity, such as acting as an antigen for an antibody; regulatory activity, such as that exhibited by many proteins which control transcription and/or translation of not only their encoding nucleic acids but other nucleic acids as well; or enzymatic activity, for example, kinase activity.

10. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

11. Claim 4 is rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claim 4 is drawn to a pharmaceutical composition comprising the antisense molecule comprising the complement of SEQ ID NO: 1 or a portion thereof.

It is well known in the art that for an agent to be used as a pharmaceutical composition, the effective dose of the specific agent, as well as the specific disease/disorder for which it is to be used must be known. Further, when a new agent is to be used in a pharmaceutical composition, there is also a need for the demonstration that said dosage of the agent would be effective in its use of treating said disease/disorder in an art accepted animal model. Without such knowledge one skilled in the art would be unable to make and use the claimed invention without undue experimentation. In the instant application the specification fails to provide such details.

12. Claim 19 (20 and 22 dependent from) is rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a recombinant polynucleotide comprising a promoter sequence operably linked to a polynucleotide encoding a polypeptide having at least 90% sequence identity to the amino acid sequence of SEQ ID NO: 2, wherein said polypeptide has kinase activity, does not reasonably provide enablement for any recombinant polynucleotide comprising a promoter sequence operably linked to a polynucleotide encoding a polypeptide comprising an amino acid sequence selected from the group consisting of a biologically active fragment of an amino acid sequence of SEQ ID NO: 2 or an immunogenic fragment of an amino acid sequence of SEQ ID NO: 2.. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims.

Claim 19 (20 and 22 dependent from) is so broad as to encompass any recombinant polynucleotide comprising a promoter sequence operably linked to a polynucleotide encoding a polypeptide comprising an amino acid sequence selected from the group consisting of a biologically active fragment of an amino acid sequence of SEQ ID NO: 2 or an immunogenic fragment of an amino acid sequence of SEQ ID NO: 2. The scope of the claim is not commensurate with the enablement provided by the disclosure with regard to the utility of the DNA encoding the extremely large number of polypeptides broadly encompassed by the claim. It would require undue experimentation of the skilled artisan to use any of the claimed DNA molecules encoding any polypeptide comprising an amino acid sequence selected from the group

consisting of any biologically active fragment of an amino acid sequence of SEQ ID NO: 2 or any immunogenic fragment of an amino acid sequence of SEQ ID NO: 2. The specification is limited to teaching use of "partial polypeptide" of human Jak2 kinase as enzymatic catalysts and provides no guidance with regard to other uses. In view of the great breadth of the claims, amount of experimentation required to make the claimed DNA, the lack of guidance, working examples, and unpredictability of the art in predicting function from a polypeptide primary structure, the claimed invention would require undue experimentation. As such, the specification fails to teach one of ordinary skill how to use the full scope of the polynucleotides encompassed by this claim.

Thus, applicants have not provided sufficient guidance to enable one of ordinary skill in the art to make and use the claimed invention in a manner reasonably correlated with the scope of the claims broadly including any recombinant polynucleotide comprising a promoter sequence operably linked to a polynucleotide encoding a polypeptide comprising an amino acid sequence selected from the group consisting of any biologically active fragment of an amino acid sequence of SEQ ID NO: 2 or any immunogenic fragment of an amino acid sequence of SEQ ID NO: 2. The scope of the claims must bear a reasonable correlation with the scope of enablement (In re Fisher, 166 USPQ 19 24 (CCPA 1970)). Without sufficient guidance, determination of having the desired biological characteristics is unpredictable and the experimentation left to those skilled in the art is unnecessarily, and improperly, extensive and undue. See In re Wands 858 F.2d 731, 8 USPQ2nd 1400 (Fed. Cir, 1988).

The inclusion of language such as wherein the polypeptide has kinase activity may help applicants overcome problems presented above with respect to the utility of claimed DNA.

13. Claim 19 (20 and 22 dependent from) is rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 19 is directed to a genus of DNA molecules encoding a polypeptide comprising an amino acid sequence of SEQ ID NO: 2, biologically active or immunogenic fragments of SEQ ID NO: 2 or a naturally occurring amino acid sequence having at least 90% identity to the amino acid sequence of SEQ ID NO: 2 which encompass allelic variants of SEQ ID NO: 1.

14. Claim 19 (c) and (d) is specifically directed to those DNAs encoding a polypeptide comprising a biologically active or immunogenic fragments of SEQ ID NO: 2. The specification, however, only provides a single representative species encompassed by this claim, that is the DNA of SEQ ID NO: 2 . There is no disclosure of any particular structure to function/activity relationship in the single disclosed species. The specification also fails to describe additional representative species of these DNAs by any identifying structural characteristics or properties other than the biologically active or immunogenic, for which no predictability of structure is apparent. Since the claimed genus encompasses DNAs yet to be discovered, DNA constructs that encode fusion proteins, etc., the disclosed structural feature of SEQ ID NO: 2 does not "constitute a substantial portion" of the claimed genus. Given this lack of additional

representative species as encompassed by the claims, Applicants have failed to sufficiently describe the claimed invention, in such full, clear, concise, and exact terms that a skilled artisan would recognize Applicants were in possession of the claimed invention.

Further, Claim 19 (b) encompasses "allelic sequences". An "allelic sequence" is an alternative form of the gene which may result in at least one mutation in the nucleic acid sequence. Alleles may result in altered mRNA or polypeptides whose structure or function may or may not be altered. This definition does not provide any specific information about the structure of naturally occurring (alleles) variants of SEQ ID NO: 2 (i.e. where are the regions within which mutations are likely to occur) nor discloses any function for naturally occurring variants. There is no description of the mutational sites that exist in nature, and there is no description of how the structure of SEQ ID NO: 2 relates to the structure of any naturally occurring alleles. The general knowledge in the art concerning alleles dose not provide any indication of how one allele is representative of unknown alleles. The nature of alleles is such that they are variant structures, and in the present state of the art structure of one does not provide guidance to the structure of others. The genus of DNAs that comprise the claimed DNA molecules is a large variable genus with potentiality of encoding many different proteins. Therefore, many functionally unrelated DNAs are encompassed within the scope of these claims. The specification discloses only a single species of the claimed genus (i.e the sequence encoding SEQ ID NO: 2) which is insufficient to put one of skill in the art in possession of the attributes and features of all species within the claimed genus. Therefore, one skilled in the art cannot

reasonably conclude that the applicant had possession of the claimed invention at the time the instant application was filed.

Applicant is referred to the revised interim guidelines concerning compliance with the written description requirement of U.S.C. 112, first paragraph, published in the Official Gazette and also available at www.uspto.gov.

Claim Rejections - 35 USC § 102

15. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless --
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

16. Claim 19 is rejected under 35 U.S.C. 102(b) as being anticipated by Silvennoinen et al. (Proc. Natl. Acad. Sci. USA 90:8429-8433, 1993).

Silvennoinen et al. teach the structure of the murine Jak2 protein-tyrosine kinase and its role in interleukin 3 signal transduction. They specifically teach the cloning of a full-length cDNA clone for murine Jak1 and Jak2 protein-tyrosine kinase. A comparison of the amino acid sequence of the murine Jak2 protein shows that its best local similarity is 93.3% with that of SEQ ID NO: 2. These cDNAs were inserted into pBSK plasmid to make transcripts with T3 RNA polymerase (See page 8430, top of column 1). Further, the polynucleotide taught by Silvennoinen et al. encodes a polynucleotide comprising a naturally occurring amino acid

sequence, as well a biologically active and immunogenic fragments of an amino acid sequence of SEQ ID NO: 2. Therefore, claim 19 is anticipated by Silvennoinen et al.

17. Claim 19 is rejected under 35 U.S.C. 102(b) as being anticipated by Wilks et al. (Mol. Cell. Biol. 11: 2057-2065, 1991).

Wilks et al. teach two novel protein-tyrosine kinases, each with a second phosphotransferase-related catalytic domain, defining a new class of protein kinases. They specifically teach the cloning of a cDNA clone for murine Jak1 and Jak2 protein-tyrosine kinase. A comparison of the amino acid sequence of the murine Jak2 protein shows that its best local similarity is 95.3% with that of SEQ ID NO: 2 between amino acid residue 536 to 1121. Further, the polynucleotide taught by Wilks et al. encodes a polynucleotide comprising a naturally occurring amino acid sequence, as well a biologically active and immunogenic fragments of an amino acid sequence of SEQ ID NO: 2. These clones were isolated from cDNA libraries and sequenced using common DNA sequencing strategies. Therefore, claim 19 is anticipated by Silvennoinen et al.

Claim Rejections - 35 USC § 103

18. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

19. Claims 20 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Silvennoinen et al. (Proc. Natl. Acad. Sci. USA 90:8429-8433, 1993).

As discussed above, Silvennoinen et al. teach the structure of the murine Jak2 protein-tyrosine kinase and its role in interleukin 3 signal transduction. They further teach the cloning of a full-length cDNA clone for murine Jak1 and Jak2 protein-tyrosine kinase.

One of ordinary skill in the art at the time of filing would have been motivated to transform a cell with a recombinant plasmid comprising a promoter operably linked the polynucleotide taught by Silvennoinen et al. to produce murine Jak2 protein to further study its role in signal transduction in the hemapoietic system. The many advantages of recombinant production of useful proteins are well known within the art as are recombinant methods of obtaining the necessary genes. These advantages include the ability to produce much larger quantities of the protein, being able to produce the protein in more easily handled organisms, reducing the number of steps necessary for the purification of a protein and producing the protein in a purer form by using an organism that does not include naturally occurring contaminants of the protein. Further still expression in an eucaryotic cell will also result in the protein being glycosylated, an important post-translational modification involved in proper protein function.

20. Claims 20 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wilks et al.(Mol. Cell. Biol. 11: 2057-2065, 1991).

As discussed above, Wilks et al. teach the structure of the murine Jak2 protein-tyrosine kinase and its role in interleukin 3 signal transduction. They further teach the cloning of a full-length cDNA clone for murine Jak1 and Jak2 protein-tyrosine kinase.

One of ordinary skill in the art at the time of filing would have been motivated to transform a cell with a recombinant plasmid comprising a promoter operably linked the polynucleotide taught by Silvennoinen et al. to produce murine Jak2 protein to further study its role in signal transduction in the hemapoietic system. The many advantages of recombinant production of useful proteins are well known within the art as are recombinant methods of obtaining the necessary genes. These advantages include the ability to produce much larger quantities of the protein, being able to produce the protein in more easily handled organisms, reducing the number of steps necessary for the purification of a protein and producing the protein in a purer form by using an organism that does not include naturally occurring contaminants of the protein. Further still expression in an eucaryotic cell will also result in the protein being glycosylated, an important post-translational modification involved in proper protein function.

21. Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Silvennoinen et al.

As discussed above, Silvennoinen et al. teach the structure of the murine Jak2 protein-tyrosine kinase, its role in interleukin 3 signal transduction and the cloning of a full-length cDNA clone for murine Jak1 and Jak2 protein-tyrosine kinase. A comparison of the amino acid

sequence of the murine Jak2 protein shows that its best local similarity is 93.3% with that of SEQ ID NO: 2.

One of ordinary skill in the art at the time of filing would have been motivated to use the sequence taught by Silvennoinen et al. to design oligomers for use as primers to amplify and determine the level of mRNA encoding the murine Jak2 protein or to isolate other mRNAs encoding related proteins such as human Jak2 using hybridization or polymerase chain reaction methodology. As discussed above, and seen in the comparison of the sequence of SEQ ID NO: 1 with the murine Jak2 cDNA, there exists many regions of identity between the two cDNAs. It is noted that it is a common practice in the art to design oligomers such that they do not correspond exactly to the sequence on which they are based. For instance often they are degenerate in order to identify additional memgers of a family and they encorporate additional bases for cloning, etc. Thus an oligomer of the polynucleotide comprising the nucleic acid sequence of SEQ ID NO: 1 is made obvious by Silvennoinen et al. Further, one of ordinary skill in the art would have been motivated to use these oligomers as part of a diagnostic test for measuring the level of murine and human Jak2 mRNA levels. Further motivation for the design and use of oligomers based on murine Jak2 is that Silvennoinen et al. teach that the Jak2 protein is regulated in response to IL-3 and is involved in signal transduction associated with hematopoiesis and there interest in the role of Jak1 and Jak2 genes in IL-3 signal transduction.

Double Patenting

22. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

23. Claims 19, 20 and 22 are rejected under the judicially created doctrine of double patenting over claims 1-3 of U. S. Patent No. 5,914,393 since the claims, if allowed, would improperly extend the "right to exclude" already granted in the patent.

The subject matter claimed in the instant application is fully disclosed in the patent and is covered by the patent since the patent and the application are claiming common subject matter, as follows: A purified polynucleotide consisting of a nucleic acid sequence encoding the polypeptide of SEQ ID NO: 2.

Furthermore, there is no apparent reason why applicant was prevented from presenting claims corresponding to those of the instant application during prosecution of the application which matured into a patent. See *In re Schneller*, 397 F.2d 350, 158 USPQ 210 (CCPA 1968). See also MPEP § 804.

24. Claims 4, 6, 7 and 23-28 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-3 of U. S. Patent No. 5,914,393 . Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims drawn to a oligomer and its method of use (claims 6 and 7)or a composition comprising the antisense molecule (claim4) of a polynucleotide comprising SEQ ID NO: 1, as well as a method of detecting a a polynucleotide comprising a sequence of SEQ ID NO: 1 or variants thereof (claims 23-28) is obvious over claims to the polynucleotide consisting of SEQ ID NO: 1 or the complement thereof (claims 1-3).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard Hutson whose telephone number is (703) 308-0066. The examiner can normally be reached on M-F from 7:30 to 4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ponnathapy Achutamurthy (Murthy), can be reached on (703) 308-3804. The fax number for Official Papers to Technology Center 1600 is (703) 305-3014.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0196.

Richard Hutson Ph.D.
8/17/2000